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INTELLECTUAL PROPERTY

Foreign pirates are growing problem Page 8

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NEWS

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News of the Week

■ **Scanning tunneling microscope is now used to image surface atoms and the individual electronic bonds that hold them in place.** **Page 4**

■ **California likely to alter unitary tax; pending legislation would give multinational corporations alternative method of calculating state taxes.** **Page 5**

■ **Toxic gases released from lake bottom by natural disturbance kill at least 1500 and injure hundreds near Lake Nios in Cameroon.** **Page 5**

■ **Federal district court blocks payments of agent orange settlement benefits to Vietnam war veterans.** **Page 6**

■ **Lehigh University purchase of labs from Bethlehem Steel will double the size of its campus.** **Page 6**

Letters 2

Concentrates
Business 15
Government 19
Science/Technology 25

The Departments
Awards 31
Newscripts 44

Business

Biotechnology firms' revenues rose substantially in second-quarter 1986 because of higher product sales and new research contracts. **Page 17**

Government

New chemical spill test facility run by Department of Energy conducts first tests; site is available to private industry. **Page 20**

Office of Management & Budget changes regulatory review procedures, and opts for more open process. **Page 21**

Science

Research on anticancer activity of mitomycins reveals information on metabolic activation and reactions of metabolites with DNA. **Page 26**

Physicist Charles R. Gossett has developed a method to detect the presence of light elements near the surface of a solid. **Page 27**

Technology

Use of coal-water mixture in fluidized-bed combustors scheduled for tests by Department of Energy and two British organizations. **Page 28**

Books

"High Tech and Toxics: A Guide for Local Communities" tackles the emotional issue of environmental pollution. **Page 29**

News Focus

Increased piracy by overseas companies of U.S. agrochemical and drug firms' intellectual property has companies turning to Washington for stronger protection. **Page 8**

Biotechnology Firms Record Substantial Revenue Increases

Product sales are on the rise as are costs of conducting proprietary research; equity and debt offerings help firms strengthen cash balances

David Webber, C&EN New York

Thanks to either higher product sales or new and bigger collaborative research agreements, most biotechnology firms' total revenues rose substantially in second-quarter 1986. At the same time, some companies—Genentech, Applied Biosystems, and Centocor, in particular—reported net income that made them highly profitable by most measures, whereas other firms reduced net earnings or widened losses as they boosted spending on proprietary research and development.

The second three months of the year also featured a large number of stock offerings—both initial and secondary—that bolstered assets around the industry. As a result of the initial stock offerings, several companies are now publicly reporting their financial performance for the first time.

Calgene, Davis, Calif., for example, went public July 8 with a stock offering that netted the company $29.3 million from the sale of 2.25 million shares of common stock. During the second quarter (the company's fiscal third quarter), Calgene forged new relationships with Procter & Gamble and Philip Morris and expanded its contract R&D agreements with Campbell Soup and Rhône-Poulenc Agrochimie.

In addition, in May Calgene acquired Agro Ingredients, a marketer of specialty plant oils and ingredients to industrial users and food processors. Also during the second quarter, Calgene signed an agreement with Ciba-Geigy under which Calgene will develop disease-resistant crop plants.

As a result of the new research contracts, Calgene's product development revenues jumped 217% to $1.1 million. Sales, nonexistent the year before, totaled $882,000, essentially the result of the Agro Ingredients acquisition. Overall, Calgene's total revenues ballooned 465% to $2.1 million, while the company's net loss narrowed to $329,000 from a deficit of $1.1 million in last year's second quarter.

Genetics Institute, Cambridge, Mass., went public in May with an

Revenues rose sharply in the second quarter

	SECOND-QUARTER 1986[a]						FIRST-HALF 1986[a]					
	Revenues[b] ($ millions)	Earnings[c]	Change from 1985 Revenues	Change from 1985 Earnings	Profit margin[d] 1986	Profit margin[d] 1985	Revenues[b] ($ millions)	Earnings[c]	Change from 1985 Revenues	Change from 1985 Earnings	Profit margin[d] 1986	Profit margin[d] 1985
Amgen	$ 7.700	$0.474	133%	nm	6.2%	def	$14.569	$ 0.679	119%	nm	4.7%	def
Applied Biosystems	16.775	2.770	41	25%	16.5	18.6%	31.991	5.424	43	31%	17.0	18.6
Biogen	2.849	−6.677	−57	def	def	def	6.671	−12.944	−42	def	def	def
BioTechnica International	1.729	−0.900	36	def	def	def	3.602	−2.022	44	def	def	def
Calgene	2.101	−0.329	465	def	def	def	3.310	−0.634	482	def	def	def
California Biotechnology	3.867	0.066	64	38	1.7	2.0	7.111	−0.083	64	def	def	def
Centocor	8.690	1.912	63	138	22.0	15.1	15.991	3.514	63	171	22.0	13.2
Cetus	12.537	0.015	16	−97	0.1	4.9	27.539	0.375	18	−50	1.4	3.2
Damon Biotech	1.284	−2.622	39	def	def	def	2.857	−7.980	6	def	def	def
Genentech	32.649	2.823	52	156	8.6	5.1	61.691	4.576	48	152	7.4	4.4
Genetics Institute	4.878	−1.038	29	def	def	def	9.295	−1.975	30	def	def	def
Immunex	2.175	−0.181	211	def	def	def	3.483	−1.029	166	def	def	def
Molecular Genetics	1.584	−1.263	−17	def	def	def	4.346	−1.250	2	def	def	def
Monoclonal Antibodies	2.444	0.139	36	nm	5.7	def	4.996	0.320	51	nm	6.4	def
Ribi ImmunoChem	0.413	−0.081	144	def	def	def	0.808	−0.116	145	def	def	def
Synergen	2.001	0.064	15	−59	3.2	9.1	4.232	0.365	23	−10	8.6	11.8

a For three-month and six-month periods ending closest to June 30. b Includes sales, contract research, royalty, and interest revenues. c Excludes extraordinary credits and nonrecurring items. d After-tax income as a percentage of sales. def = deficit. nm = not meaningful.

Product sales account for greater revenues

	Product sales ($ millions)	% change from 1985	Sales as % of total revenues 1986	1985
Amgen	$ 0.237	11%	3%	6%
Applied Biosystems	14.621	41	87	88
Biogen	0	nm	nm	nm
BioTechnica International	0	nm	nm	nm
Calgene	0.882	nm	42	nm
California Biotechnology	0	nm	nm	nm
Centocor	2.652	55	31	32
Cetus	0.554	98	4	3
Damon Biotech	0	nm	nm	nm
Genentech	9.461	nm	29	nm
Genetics Institute	0	nm	nm	nm
Immunex	0	nm	nm	nm
Molecular Genetics	0.103	−60	7	13
Monoclonal Antibodies[a]	na	nm	nm	nm
Ribi ImmunoChem	0.128	35	31	56
Synergen	0	nm	nm	nm

a Not available. In quarter ending March 31, 1986, product sales accounted for 87% of total revenues. na = not available. nm = not meaningful.

initial offering of 2.88 million shares that raised more than $85 million. Like Calgene, the company arranged several new product development agreements and increased certain existing collaborative arrangements, says Gabriel Schmergel, president and chief executive officer. Those achievements helped raise revenue 29% to $4.9 million in the quarter.

At the same time, Genetics Institute's net loss for the quarter widened to $1.0 million from $769,000 in the year-earlier period. The reason is an increase in operating expenses associated with proprietary research and product development. Operating expenses jumped nearly 20% in the quarter.

"We are in the process of expanding our proprietary product development programs, which naturally will increase our operating expenses without providing related revenue coverage," Schmergel explains. "We are committed to allocating a prudent level of equity capital to the development of proprietary products with attractive risk/reward profiles."

Among other newly public companies reporting financial performance for the first time, losses tended to widen as the firms, their bank balances built up through the stock market, added staff members and shifted activities to proprietary research. Liposome, Princeton, N.J., which made an initial offering on July 23, reported that it lost $1.1 million on revenues of $632,000 ($457,000 in R&D fees, the rest in interest income). The quarterly loss increased $213,000 over second-quarter 1985. Cytogen, Princeton, N.J., lost $1.0 million on $569,000 in revenues. The loss was $52,000 greater than in the comparable 1985 period. T Cell Sciences, Cambridge, Mass., lost $1.7 million in the year ending April 30, 1986. That represented an extra $670,000 in deficit for the company, which went public in May.

Sales of genetic engineering products achieved their greatest prominence in the second quarter at Genentech. The industry leader raised its overall revenues 52% to more than $32.6 million in the quarter. The most important single element in that sharp increase was the $9.5 million in revenues from sales of Protropin human growth hormone, first commercialized last fall. Product sales accounted for 29% of total revenues in the second quarter. As a result, net income jumped 156% to $2.8 million. Over the first six months of the year, Genentech total revenues climbed 48% to $61.7 million, and earnings rose 152% to $4.6 million.

Another firm with a big rise in biotechnology product sales was Centocor, Malvern, Pa. Centocor raised total revenues 63% to $8.7 million, helped considerably by product sales of $2.7 million, up 55% from the year-earlier quarter. As a result, product sales accounted for 31% of total revenues, compared with 32% a year before and 34% in first-quarter 1986.

At Immunex, Seattle, second-quarter revenues leaped 211% to nearly $2.2 million. At the same time, the company reduced its net loss to $181,000, compared with a $1.2 million deficit a year before. The chief reasons for the company's increase in revenues were increased research activities and the passing of research milestones in Immunex's collaboration with Behringwerke of West Germany, and its joint venture with Eastman Kodak to develop human immunological therapeutic products, the company says.

Research revenues in the quarter increased 282% to $1.8 million. Interest income, generated from an asset base bolstered by the company's March stock offering, nearly doubled to $422,000.

California Biotechnology also benefited from a sharp increase in R&D contract revenues and interest income. Research revenues jumped 34% to $2.2 million in the second quarter, and investment income increased 136% to $1.6 million. As a result, total revenues rose 64% to $3.9 million, but net income was small.

The company concluded two important commercial agreements during the second quarter, according to chairman William G. Baker Jr. Cal Bio is researching for Hoffmann-La Roche the use of the biotechnology company's nasal delivery technology with antiobesity and growth hormone products. In addition, Cal Bio signed a licensing agreement with Byk Gulden, a West German pharmaceutical company, covering European marketing rights for Cal Bio's lung surfactant, a product under development to treat infant respiratory distress syndrome. □